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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/928,257	08/10/2001	Baining Guo	MS1-952US	5744

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EXAMINER	
NGUYEN, KIMBINH T	

ART UNIT	PAPER NUMBER
2671	

DATE MAILED: 11/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/928,257	GUO ET AL.	
	Examiner	Art Unit	
	Kimbinh T. Nguyen	2671	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-7,27-36 and 45-50* is/are allowed.

6)☒ Claim(s) *8-26 and 37-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to amendment filed 08/04/04.

2. Claims 1-50 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8-26, 37-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Groller et al. "Modeling and Visualization of Knitwear", IEEE 1995, pages 302-310 in view of Westin et al. "Predicting Reflectance Functions from Complex Surfaces", ACM published 1992.

Claim 8, Groller discloses generating a macrostructure for a 3D object (rendering the macrostructure of woven materials; section 1. Introduction, page 302) defined by axes (fig. 5); applying a semitransparent microstructure (yarn microstructure), defined by reflection points to the macrostructure by moving (rotating) the plane of reflection points (points P0-P6; fig. 5) respect to axis to yield a 3D model (see section II and III, pages 302-305). Groller teaches an anisotropic lighting model consisting of specular reflection and does not teach transparent model; however, Westin et al. teaches "to model microgeometries that include transparent materials (see section 4.3 "Specular Transmission"). It would have been obvious to one of ordinary skill in the art at the time

the invention was made to incorporate the teaching of modeling the microgeometries that include transparent materials taught by Westin into knitwear modeling of Groller's teaching for modeling textile materials, because using transparent medium material, it would preserve energy flux density and radiance of specular reflection transmission (see section 4.3).

Claim 9, Groller teach a semitransparent microstructure (yarn microstructure), defined by reflection points by moving (rotating) the plane of reflection points (points P0-P6; fig. 5) respect to axis to yield a 3D model (see section II and III, pages 302-305) and translating the plane with respect each axis while perpendicular thereto (a rotational symmetric distribution function, which was translated in correspondence with the centers of individual subyarns; each grid point is projected orthogonally; axes are mutually orthogonal (perpendicular); see page 305; fig. 8).

Claim 10, Groller discloses the microstructure simulates a cross section consisting of: human hair; fur; yarn (see section "Introduction", page 302).

Claims 11, Groller teaches rendering the 3D model (visualizing the 3D structure of knitwear explicitly allows a fast virtual design of knitted fabric; see section 1: Introduction, page 302) from a combination of images of reflection points at positions with respect to the axis (rendering of knitwear structures; see section IV, page 305).

Claim 12, the rationale provided in the rejection of claim 8 is incorporated herein. In addition, Groller teaches a computer readable-media comprising computer-executable instructions (C++ and CAD program, see section "Results and Images, page 306).

Claims 13-17, the rationale provided in the rejection of claim 8 is incorporated here in. In, addition, Groller teaches applying a stitch pattern to each axis (simple knitwear patterns are made up of only two type of loops (R-loop or plain stitch and L-loop or reverse stitch, see section "A simple knitwear model", page 302); applying a lumislice (cross sectional slice of yarn) to the stitch pattern (translating, rotating) to yield a 3D knitwear model; combination of images of the lumislice (cross section slice of yarn); 3D knitwear model including "density of scattered spots" (see section III and IV, pages 304-306; fig. 7); a computer-readable media (CAD program PYTHA).

Claims 18-26, the rationale provide in the rejection of claims 13-17 is incorporated herein. In addition, Groller teaches the macrostructure being defined by axes connecting of control points which situated at an intersection of axes (a large number of points are generated. These points are taken to define a footprint, see the left column of page 305); the macrostructure yarn is based on a color pattern (consists of different colored subyarn, see the right column of page 306); the 3D surface being partitioned into quadrilaterals corresponding to the stitch pattern (see section IV, pages 305-306; fig. 9); connecting key points of the quadrilateral with curved segments to yield a stitch loop (R-loop and L-loop, see section II, pages 302-304); introducing irregularities in stitch pattern of macrostructure (reverse stitch, see the bottom of page 302); interactions among the reflection points (small-scale interaction, the interaction between the knitting yarn and loops of stitch) at different locations (row by row of knitwear pattern) on the macrostructure (see section II, pages 302-303).

Claim 37, the rationale provide in the rejection of claim 18 is incorporated herein. In addition, Groller et al. teaches rendering a 3D knitwear model (rendering of knitted fabrics is done through direct volume visualization, see section IV "Efficient rendering of knitwear structures, page 305).

Claims 38-44, the rationale provide in the rejection of claims 19-24 and 26 is incorporated herein.

Allowable Subject Matter

5. Claims 1-7, 27-36, 45-50 are allowed.

The following is an examiner's statement of reasons for allowance:

Claims 1 and 27, the prior art does not teach rendering an image of the plurality of reflection points at a plurality of positions with respect to the axis such that each the point maps an elongated, continuous image.

Claim 45, the prior art does not teach applying a lumislice, with respect to a resolution of the distance of the view of the scene and a sampling density, to each stitch of the stitch pattern of the sorted discretized yarn segments by translating and rotating the lumislice perpendicular to and respectively along and about each stitch of the stitch pattern applied to the plurality of intersecting axes, wherein the lumislice is semitransparent and is computed from a fiber distribution of a yarn cross-section.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

6. With respect to Applicant's arguments about claims 8-26 and 37-44 have been fully considered but they are not persuasive, because Groller teaches rendering the 3D model (visualizing the 3D structure of knitwear explicitly allows a fast virtual design of knitted fabric; see section 1: Introduction, page 302); rendering a 3D knitwear model by using volume data set (rendering of knitted fabrics is done through direct volume visualization, see section IV "Efficient rendering of knitwear structures, page 305), "Our technique models the yarn microstructure as 3D data to allow a close up inspection of the model (see Introduction, page 302). The arguments of "map fabric structures onto free-form surfaces" has not disclosed in the claims 8, 13, 18 and 37.

THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kimbinh Nguyen** whose telephone number is **(703) 305-9683**. The examiner can normally be reached **(Monday- Thursday from 7:00 AM to 4:30 PM and alternate Fridays from 7:00 AM to 3:30 PM)**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Part II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 3, 2004

Kimbinh Nguyen

Patent Examiner AU 2671